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article for an authoritative, condensed statement of a conclusion adverse to Weber's Law, of another principle which one of the authors would substitute for Weber's Law, and of the grounds on which both these claims rest.

J. M. B.

Ueber Sensomobilität. SIGM. EXNER. *Pflüger's Archiv.* 1891, XLVIII. 592.

Following experiments (already published) of the author and Herr Pineles of Vienna, on the motor effects of sensory lesions, this paper discusses the various ways in which motor impulses are regulated or controlled by the sensations to which they give rise. The author finds three not sharply distinguished cases: 1. In reflex actions—where neither the original stimulus nor the sensation caused by the motor impulse reaches consciousness (*e. g.*, intestinal movements), or the sensation may affect consciousness (*e. g.*, contraction of the pupils) and be controlled by the will (*e. g.*, winking). This he calls *subcortical control* (subcorticale Regulierung). 2. This subcortical action is not limited to reflexes, but may control acts which are pre-determined and are to be set in operation by some stimulus and guided by attention (*e. g.*, focusing the eyes). This is *control by determination* (Intentionsregulierung). 3. A *conscious* movement calls forth sensations which are essential to the correct execution of the movement (as in speech). This is *cortical control*. Bodily movements are in a high degree dependent on the senses. Disturbances of sensibility give rise to motor disturbances by removing one or other of the above-mentioned kinds of control.

Berlin.

H. C. WARREN.

Des Phénomènes de Synopsie. Par TH. FLOURNOY. Paris, Alcan, 1893.

M. Flournoy includes all the phenomena of "Colored Hearing" and of "Mental Forms" under the convenient and adequate name *Synæsthesia*—in place of which, to be sure, he himself usually employs the less defensible term *Synopsie*. One of the prominent features of the book is in fact the clearness and the usefulness of terminology and of classification, an especially important merit at this time, when the reaction against the formalism of classification without observation has resulted in the opposite tendency to make of psychological records a bare, formless diary of facts. The phenomena of synæsthesia are divided into three main groups: "*photisms*," among which are included, as by Bleuler and Lehmann, all the varieties of pseudo-chromesthesia; "*Schemes*," comprising not only "*forms*" (*diagrammes*) associated with series of words or numbers, but "*symbols*," or particular figures associated with single letters, numerals, colors and the like; and "*personifications*," in which the associated factor is no mere color or form, but has become richer and more concrete. From the standpoint of intensity, the phenomena are "*objectified*," "*simply imagined*," "*localized*" or "*thought*;" M. Flournoy has never observed a case in which color or form is actually objectified, but admits the possibility, chiefly on the testimony of Herr Ed. Gruber. The book is the result of the detailed observation by M. Flournoy of particular cases and of a statistical investigation undertaken by M. Claparède, in which 694 answers were received to 2600 circulars of inquiry. Not the least diverting part of the book, especially to any one who

has ever undertaken statistical study, is the humorous comment upon the indifference of the public—even of a university public—to psychological inquiry. One-half of the 694 answers recorded positive facts of synæsthesia; but M. Flournoy properly concludes that most of the 1900 who failed to answer would have replied in the negative. Of the 371 positive cases, more than one-half include photisms (a conclusion entirely at variance with the results of my own observation of more than 200 cases). Forms are described in detail under the heads "*forme-matière-localisation des diagrammes*," and the text is illustrated by more than 100 reproductions of forms. The careful tabulation of the colors assigned in 943 different cases to single letters is compared with the similar formulations of Fechner and of Bleuler and Lehmann. The result is the demonstration of the apparently complete individuality and lawlessness of such identifications of colors with letters. Flournoy detects a "*Loi de clarté*," in accordance with which *i* and *e* are usually light (or bright); *a* and *o* usually of medium intensity; and *u* and *ou* dark;¹ but even this is contradicted by the results of President Jordan's observation and of the Wellesley statistics, which record *o* as commonly white or light.

Less than one-ninth (46) of M. Flournoy's subjects connect colors with consonants, while two-thirds (247) have colors with vowels. This result contradicts my own, but is founded on the study of a far larger number of cases, and accords with Galton's results. It is noticeable, however, that the form of inquiry which included consonants, diphthongs, words, music, etc., in one question, facilitated a carelessness of response at just this point.

M. Claparède's questions were indeed too simple and too condensed to permit statistical justification for many of M. Flournoy's conclusions. These are all, however, based on observation and are uniformly well-considered and undogmatic. The narrowly "physiological" theory of synæsthesia is opposed and, with a passing mention of the influence of the habitual, and of vivid, intellectual association, the chief explanation is found in an emotional association, while emotions are defined in terms of Dr. James' theory as "*sensations de retour, dues aux modifications réflexes produites dans toute l'étendue de l'organisme par [une] perception.*"

MARY WHITON CALKINS.

¹The reference of course is to the letters as pronounced in French.